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Operations and Performance Management

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When global firms launch new products, a complex chain of suppliers, raw materials and distribution helps deliver them to customers. It is not uncommon for complex products like Apple's iPhone to sell several million units in over 50 countries within the first few days of launch. Thereafter, there is the challenge of ensuring that supplies are replenished and customer demands continue to be met. Ensuring that manufacture, assembly, testing, delivery and support work effectively and efficiently is the realm of the modern operations manager.

Operations management

Operations management is the management discipline that deals with the design and management of products, processes, services and supply chains. It considers the acquisition, development and utilization of resources firms need to deliver the goods and services their customers want. Basically, all organisations, whether they are industrial, manufacturing, service or public sector organisations, have operations. They all have to organise their resources to deliver products and services to their customers on a day-to-day basis.

In a nutshell, operations management is about translating and executing an organisation's objectives, policies and strategies in day-to-day operations and ultimately delivering the performance objectives of the organisation. Therefore, it is important that, before we go in to too much detail on how to manage business operations, we understand how organisations perform. For this reason this chapter provides an overview of the origins and evolution of operations

management, explains how businesses (organisations) perform, and discusses how operations management can contribute towards overall organisational performance.

Above we defined operations management as *the management discipline that deals with the design and management of products, processes, services and supply chains. It considers acquisition development and utilisation of resources firms need to deliver the goods and services their customers want.*

If we elaborate on this definition, then operations management is really about products and services and the processes we use to deliver those services to our customers. We also recognise that organisations are not islands; they don't exist themselves. Thus, in managing operations, we are not just coordinating the resources inside the organisation, we are also coordinating resources of organisations outside our own, including: suppliers, suppliers' suppliers, customer and customers' customers, i.e. the supply chain. Here suppliers could be supplying materials, equipment, transport services (e.g. somebody who's taking our products and distributing them to our customers' premises), information and so on.

The second part of this definition also considers acquisition, development and utilisation of resources. So, if you are in the business of making bottled water you have to buy the appropriate equipment, you have to have appropriate equipment to actually make those bottles of water efficiently and effectively. Questions regarding who we buy them from, their specification, how fast they operate, and their reliability, are all important and need to be considered in managing operations.

An important function of operations management is the day-to-day coordination and orchestration of the organisational resources (materials, people, equipment, information and knowledge) to efficiently and effectively deliver to its customers the products and services they want, on time, to budget, and to agreed specifications, while at the same time making sure that the organisation is operating within its own budgets, delivering profit and growth objectives to its shareholders.

Background and evolution

Operations management is an ancient discipline. For example the construction of the Great Pyramid of Giza Egypt (2650 BC) and the Great Wall of China (c. 700 BC) are all achievement of ancient operations management practices and skills. However, as a distinct field of study operations management had its foundation in the Industrial Revolution. Some would argue that operations

management as a discipline gained traction with Henry Ford's Ford Model T which, in 1903, was the first mass produced car in the world. Today, Toyota's production system, the Toyota Production System (TPS), is heralded as the best example of contemporary operations management practices.

The First Industrial Revolution significantly changed almost every aspect of society. In Europe, from about the High Middle Ages (c.1300) to the eve of the Industrial Revolution in 1750, almost everyone lived and worked in the countryside. There were some pre-industrial cities like Florence, Salamanca or London that were the hubs of learning, craft production, the beginnings of mechanics and markets. However, it was the evolution in the transportation infrastructure that was to play a large part in the change that followed. For example, in 1285, King Edward II enacted the first legislation, since the departure of the Romans in around 480 A.D., that dealt with the maintenance of roads. By about 1350, some degree of safety having returned to the roads, travel and trade increased. Roads were to improve dramatically again from 1706 with the first turnpike trusts. With the evolution of the roads came the revolution of transportation. In the pre-industrial age manufacture was limited to the small scale artisans and craftsmen, the carpenters, blacksmiths, weavers and tailors. Even today some textiles are still made by pre-industrial processes in village communities in Asia, Africa and South America.

The Industrial Revolution began in Great Britain in about 1750, spread to Western Europe and North America within a few decades and lasted until sometime between 1820 and 1840. The Second Industrial Revolution, often referred to as the Technological Revolution, spanned from the mid-nineteenth century to the First World War; from the introduction of Bessemer steel in the 1850s to the initial electrification of factories, mass production and the introduction of the production line.

Originally, the factories and mass manufacturing severely limited customer choice; producers made the goods and customers bought what was available. This is epitomised by Henry Ford's famous quote "you can have any colour you want as long as it is black," which is often cited to characterise this product-driven economy of the technological revolution. Ford is also heralded as the earliest example of mass production, and was the first recorded use of a moving conveyor belt system, where the worker stood still and the product moved past them.

An overview of the development of operations management, from the time of Ford into the modern management discipline it is today, is given in Figure 4.1. In short, operations management developed as a management discipline as the sophistication of markets developed through the years. When Frederick

Taylor wrote *Principles of Scientific Management* in 1911 (Taylor, 1998), he studied what was happening in the early factories and described it as ‘specialisation of labour’. No longer was a skilled craftsman making the whole product. Now there was a fast moving production line with a number of workers organised along the line, in such a way to maximise the throughput (flow of work) on the line. Each person was specialised in a limited range of operations such as hanging a door; putting the windows in; putting on the door handle and so on.

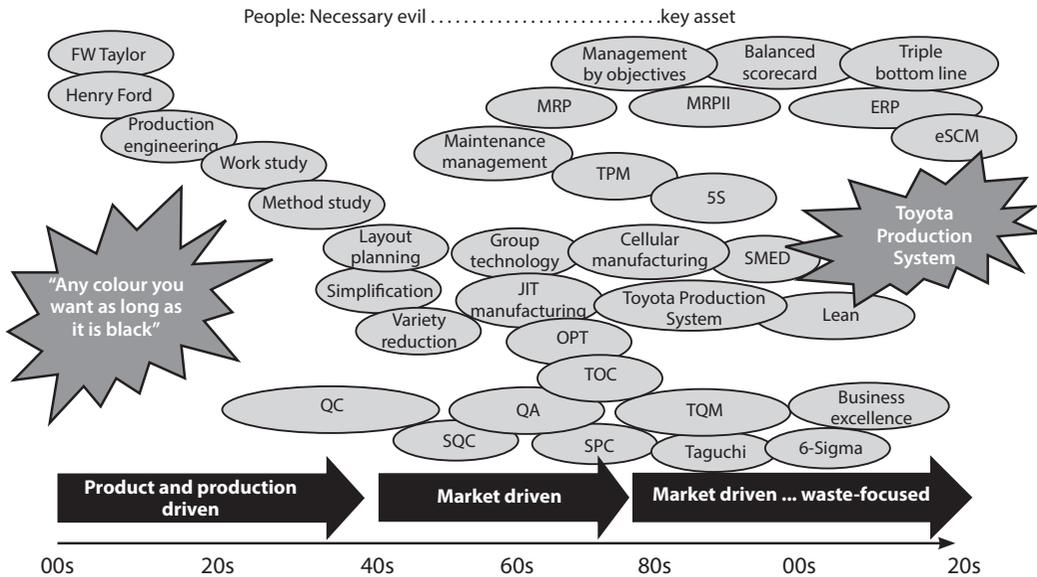


Figure 4.1: Evolution of operations management

Production engineering was borne from this line of thinking, where the key objective was *productivity*. The basic principle behind productivity is to get as much value-added work as possible from a unit of resource. Early production engineering/operations management techniques such as *work study*, *method study* and *time-motion study* were developed to study how a particular task was carried out in order to eliminate wasted motion or activity so as to improve productivity. However, as markets started to become more sophisticated and the economic power started shifting from the producer to the consumer (i.e. a market driven economy) we have seen the increase in *variety* of products that are being produced. For example, today there are over a thousand variations of a Ford Transit Van depending on the model, engine and other options customers can specify. Consequently we have seen development of techniques such as *layout planning*, *simplification* and *variety reduction* to deal with this increasing variety and complexity.